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the book contains at least brief descriptions of practically all patents bearing on the subject during the period covered by the book, and the information regarding progress in Germany during the war is probably fuller than has elsewhere appeared.

The book contains a full author and subject index, which is particularly valuable, since it includes references both to the original fourth edition and to the supplement.

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AN ENCYCLOPEDIA OF PEACHES

The Peaches of New York. By U. P. HEDRICK, assisted by G. H. HOWE, O. M. TAYLOR and C. B. TUBERGEN. New York Agricultural Experiment Station, Geneva, 1917.

Two comparisons come easily to mind on opening Professor Hedrick's "Peaches of New York." The first is with Poiteau's "Pomologie Française"; the second is with Professor Beach's "Apples of New York."

The beauty of the ripened fruit has always appealed to persons of literary taste and esthetic sensibility, and such persons have often wished to make permanent record of the delights of their gardens and orchards. There have been many notable books, covering more than a century of time, extra-illustrated with colored plates of fruits. The "Pomologie Française" may be mentioned as one of the best early examples of such work.

It might not be much to expect that the "Peaches of New York" would excel any book of a hundred years ago, and yet this standard has been so rarely reached that it is a compliment to say that any one anywhere approaches it. This new book, however, surpasses the old in two fundamental particulars, in the excellence of its plates and in the scientific assemblage of taxonomic data.

Professor Beach's "Apples of New York" comes into the comparison as being the great beginning of this notable series, which now includes the "Grapes of New York," "Plums of New York," and "Cherries of New York." It will be seen that the technical processes of color-photography and printing as applied to

this line of work have been greatly improved, even in these last few years, for though the photographing of peaches is much more difficult than the photographing of apples, the color plates of the present volume are emphatically superior. And this point will bear some emphasis, considering how important such plates are as a means of description, and considering that the accurate description of varieties is exactly the main objective of the series.

One must see, too, that the science of systematic pomology has made great progress since the days of Poiteau and Turpin. There have been catalogues of varieties with descriptions and lists of synonyms of course for nearly 200 years, but as a matter of fact the science of systematic pomology is practically a development of the last dozen years. It is, moreover, as yet almost an exclusively American science, having been developed largely by the critical pomological workers in the experiment stations and the United States Department of Agriculture. Professor Hedrick, with his quite unusual facilities and his corps of trained assistants, has been able to bring these modern methods of systematic study to a high degree of perfection. It is not too much to say that, in breadth of view, bibliographic comprehensiveness, and critical examination of detail it would be hard to find better work anywhere in the older fields of taxonomic science.

Emphasis is placed upon the systematic or encyclopedic features of the work, for these are certainly the most important. There are dozens of books and hundreds of bulletins where the reader can more easily find a discussion of how to grow peaches, but the present work will long be the first reference for all those who want the last word on the description or nomenclature of varieties.

The title is of course a brazen misnomer. The book is not limited to the peaches of New York, and probably was never intended to cover any such narrow view. It is a book for the whole United States and the peach-growing portions of Canada. In fact one might better call it "Peaches of the World," for it will doubtless be consulted as widely as Poiteau's fine old book written over seventy years

ago and called by a less provincial name, the "Pomologie Française."

F. A. W.

SPECIAL ARTICLES

COMPARISON OF THE CATALASE CONTENT OF THE BREAST MUSCLE OF WILD PIGEONS AND OF BANTAM CHICKENS

It is now generally accepted that the energy for muscular work is derived from oxidation of the food materials, although physiologists are not agreed as to the means by which the body accomplishes this oxidation at such a low temperature as 39° C., the temperature of the body.

The present investigation was carried out to determine if catalase, an enzyme which liberates oxygen from hydrogen peroxide or from an organic peroxide comparable in structure to hydrogen peroxide, is greater in amount in the breast muscles of wild pigeons accustomed to flying than it is in the breast muscle of bantam chickens not so accustomed; if the catalase content of the breast muscles of the pigeons would be decreased by decreasing the amount of work done by these muscles, and if it would be increased in the breast muscles of the chickens by increasing the amount of work done.

After several wild pigeons and bantam chickens had been washed until free of blood by the use of large quantities of 0.9 per cent. sodium chloride, as was indicated by the fact that the wash water gave no test for catalase, the breast muscles were removed and ground up separately in a hashing machine. One gram of this material was added to 50 c.c. of hydrogen peroxide in a bottle at 22° C., and as the oxygen gas was liberated it was conducted through a rubber tube to an inverted burette previously filled with water. After the volume of oxygen gas, thus collected in ten minutes, was reduced to standard atmospheric pressure the resulting volume was taken as a measure of the amount of catalase in the gram of material. It was found that one gram of the breast muscle of the wild pigeons liberated on an average, 98 c.c. of oxygen, while that of the bantam chickens liberated only about 8 c.c., hence, the amount of catalase in

the breast muscle of the wild pigeons is much greater than that of the bantam chickens.

Several wild pigeons were confined for three weeks in individual small cages so that they could not use their breast muscles in flying, while several bantam chickens were made to run and fly until they were almost exhausted once a day for fifteen days. The catalase of the breast muscles of these pigeons and chickens was determined as in the preceding. It was found that confinement decreased the catalase content of the breast muscles of the pigeons by about 40 per cent., while exercise increased that of the breast muscles of the bantam chickens by almost 25 per cent.

The fact that an increase or decrease in the amount of work, and hence in oxidation in a muscle, is accompanied by a corresponding increase or decrease in the amount of catalase, would seem to suggest that catalase may play a rôle in the oxidative processes of the body.

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CILIA IN THE ARTHROPODA

THAT cilia are absent in the Arthropoda is an assumption which has crept into our zoological literature. Thus, Adam Sedgwick in his "Student's Text-Book of Zoology," Vol. III., 1909, pp. 316-317, says: "These ducts in the female¹ retain a ciliated lining (Gaffron), the only known instance of the occurrence of a ciliated tract among the Arthropoda." Then again, we read in Parker and Haswell's "Text-Book of Zoology," Vol. I., (revised edition), 1910, p. 526, as follows: "Arthropods are also characterized by the almost universal absence of cilia." Kingsley, on page 357 of his revised edition of Hertwig's "Manual of Zoology," 1912, makes the following assertion concerning cilia in the Arthropoda: "The entire absence of cilia is noteworthy. Ciliated cells have never been found in arthropods." Still another zoologist, J. Arthur Thomson in the fifth, revised edition of his

¹ Sedgwick is discussing ducts in the female reproductive organs of *Peripatus*.